



Visitor-Feral Horse Interactions at Assateague Island National Seashore: Development of a Behavior Observation Procedure

Chrissie Ingle, Graduate Student
Dr. Yu-Fai Leung, Assistant Professor
North Carolina State University

Objectives

- To develop a behavior observation procedure to monitor visitor-feral horse interactions as part of a larger Vital Signs Monitoring project
- Evaluate the behavior observation instrument based on its accuracy and inter-observer reliability

The Horses of Assateague Island National Seashore (ASIS)

- Managed by NPS as a wild species
- One of the top reasons visitors come to ASIS
- Visitors engage in improper interactions



Developing the Procedure

- Monitoring questions
 - Location
 - Time
 - Which horses
 - What behaviors
- Logistics
 - Unsure who will conduct monitoring program
 - Interactions occur throughout developed section

Sampling Procedure

- 3 sampling sessions per day
- One drive through park roads (~2hrs)
- Stop at all interactions



Sampling Procedure

- GPS
- Photograph
- Two Observers
 - Form A
 - Form B



Form A: Observation Methods

- Martin and Bateson, 1993
 - Behavior Sampling Method
 - One-Zero Recording Method
- Five minute sampling period, 30 second intervals

Visitor and Wildlife Behaviors

- Neutral
- Attraction
 - Visitors: also feeding and touching
- Avoidance
- Aggression



Additional Observations

- During each interval
 - Number of visitors
 - Number of vehicles
 - Number of wildlife
 - Closest distance
 - Wildlife species



BEHAVIORAL ACT (✓ as appropriate)	OBSERVATION PERIOD (30-SECOND INT)						
	0-30s	30-60s	60-90s	90-120s	120-150s	150-180s	180-210s
Human Behavior Toward Wildlife							
# Motor Vehicles							
# Visitors (not in motor vehicles)							
Closest dist. (class 1-5)*							
Neutral							
Attraction							
Avoidance							
Aggression							
Feeding							
Touching							
Other: _____							
Wildlife Behavior Toward Human							
# Animals							
Species (Deer, Horse, etc.)							
Neutral							
Attraction							
Avoidance							
Aggression							
Other: _____							
* Closest Distance Classes: 1= <1m (3ft) 2= 1-3m (3-10ft) 3=3.1-6m (10-20ft) 4= 6.1-15m (20-50ft) 5: >15m (50ft)							

Testing Form A

- Two 5-minute video clips recorded in the field
- Shown to undergraduate classes in the College of Natural Resources
- Shown in different orders



Testing the Instrument

- 5 minutes of verbal instruction
 - Handout with same information
 - Verbal prompt every 30 seconds
 - Survey for demographics and comments
-

Reliability and Accuracy

- Inter-Observer Reliability
 - Students' answers compared against each other to obtain percent agreement
- Accuracy
 - Students' answers compared against correct answers (as defined by the investigators)

Reliability: Visitor Behaviors

Behaviors	Road n=83	Camp n=73
Neutral	80%	80%
Attraction	70%	66%
Avoidance	95%	95%
Aggression	100%	100%
Touching	94%	88%
Feeding	98%	98%



Reliability: Wildlife Behaviors

Behaviors	Road n=83	Camp n=76
Neutral*	80%	71%
Attraction	89%	87%
Avoidance**	98%	86%
Aggression	100%	100%



Results of Independent t-tests.

*Significant at .05

**Significant at .01

Inter-Observer Reliability

- Road clip showed higher reliability than camp clip
- Combined lowest reliability
 - Visitor attraction (68%)
 - Wildlife neutral (76%)
- Combined highest reliability
 - Visitor and wildlife aggression (100%)
 - Visitor feeding (98%)
 - Visitor avoidance (95%)
 - Wildlife avoidance (92%)

Accuracy: Visitor Behaviors

Behaviors	Road n=83	Camp n=76
Neutral	80%	80%
Attraction**	70%	57%
Avoidance	72%	72%
Aggression	100%	100%
Touching***	93%	84%
Feeding	98%	98%



Results of Independent t-tests. ** Significant at .01
*** Significant at <.001

Accuracy: Wildlife Behaviors

Behaviors	Road n=83	Camp n=76
Neutral	78%	71%
Attraction***	89%	64%
Avoidance***	98%	60%
Aggression	100%	100%



Results of Independent t-tests.
***Significant at <.001

Accuracy

- Road clip more accurate than Camp clip
- Combined lowest accuracy
 - Visitor attraction (64%)
 - Visitor avoidance (72%)
 - Wildlife neutral (75%)
- Combined highest accuracy
 - Visitor and wildlife aggression (100%)
 - Visitor feeding (98%)
 - Visitor touching (89%)

Accuracy: Effects of Clip Order and Demographics

- Clip Order
 - Road-Camp: Significantly more accurate in visitor neutral (.001)
 - Camp-Road: Significantly more accurate in wildlife neutral (.018)
- Major
 - NR majors significantly more accurate than PRT majors in visitor attraction (.048) and wildlife neutral (.000)
- Gender, Class Year
 - No significant differences

Limitations

- Video clips did not portray all behaviors
 - Behaviors on video more difficult to distinguish than in the field
 - Only 5 minutes for instruction
 - 6 classes, 5 different classrooms
-

Conclusions

- Visitor attraction and wildlife neutral LOW in both accuracy and inter-observer reliability
 - Visitor and wildlife aggression and visitor feeding HIGH in both accuracy and inter-observer reliability
 - Visitor avoidance: low accuracy, high inter-observer reliability
-

Implications

- Further explanation
 - Visitor attraction
 - Wildlife neutral
 - Visitor avoidance
- Campground clip is more difficult than roadside
 - More people and horses involved
- Need clips with aggression and feeding to confirm high accuracy and reliability



Questions?



Chrissie Ingle
Department of Parks, Recreation
and Tourism Management
North Carolina State University
mcingle@ncsu.edu